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ABSTRACT

To help government agency representatives and community leaders understand local population trends, particularly in rapid growth situations, this publication outlines a simple framework for analyzing population changes and provides useful criteria that can be applied when considering management and policy alternatives. It is noted that two "population communities" must be considered: the local community of long term residents and the newcomer community. The quide points out some of the ways population information can be used to make informed guesses about social and economic effects of development. Suggestions are included for guiding citizens in responsible public decisionmaking and policymaking so that changes can be systematically managed. The suggested framework for population analysis poses practical growth questions that any rapidly growing community can apply in analyzing its own circumstances. In order not to overwhelm the citizen or planner who may be collecting population information, the framework focuses on priority needs so that only the most useful information is sought. Definitions are included as well as sources of population data and four references. (BRR)



Coping With Growth.

Population Change: Do You Know the Trends in Your Community?

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Government agency representatives and community leaders need to understand local population trends, particularly in rapid growth situations. This publication outlines a simple framework for analyzing population changes, along with useful criteria that can be applied when considering management and policy alternatives. Sources of population information are also included.

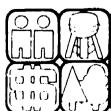
K.now Your Population

Population change is one of the most visible signs of growth. The distribution, size, and composition of the population shift, as well as the speed with which the movement occurs, has a major effect on such secondary impacts as social, cultural, political, fiscal, and environmental changes. These in turn place added demands on local government policymakers and planners.

The opening of a mine, for example, may attract workers from surrounding areas. Not only could this increase school enrollment but it could accelerate the demand for housing, public facilities, and services. Newcomers almost always press for improved services such as police and fire protection, medical care, garbage pick-up, snow removal, improved roads, larger schools. More people may generate added community income; however, these consumers may also require special services, expanded business inventories, and improved management capacities. New policies may be needed to regulate the type of growth that occurs.

Community leaders and decisionmakers can anticipate a good many of these changes and related public needs and demands through an understanding of population trends. While population information will not solve the problems of rapid growth, it can help to clarify the facts about present and future community residents. Knowing this, community leaders should find they are better prepared to meet facility and service demands before crises occur.

A small amount of population information can tell a vast amount about a community. With a mini-



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mum of quidance a citizens' committee, a work-study student, or an office clerk can assemble enough facts to explain the age structure of the local population and how it might be affected by an influx of young families. Knowing more about who newcomers are and what types of families they may bring can suggest systematic ways of providing for their arrival. This and other types of background could be helpful in deciding how to allocate funds for family planning education, health care, school buildings, or job training programs. By involving the general public in collecting, organizing, and analyzing population information, officials can build citizens' understanding of their own community, thereby assuring more knowledgeable public support for future improvements

Both private and government representatives need to be in a position to make informed guesses about population trends in order to guide citizens in responsible public choices, including setting realistic policy priorities. This knowledge is a must for evaluating the possible effects of development, because economic changes and population changes are inseparable. They interact to affect virtually everything underlying community well-being—adequate housing, stable businesses, secure jobs, serviceable streets, quality schools, dependable hospitals, adequate protection, responsive government planning and decisionmaking systems. The chart below illustrates the interdependency of these relationships.

Anticipation and management of these secondary impacts depends to a great extent on the ability of community leaders to assess and interpret changing population size, distribution, composition, and population processes. A reasonably accurate assessment will go a long way in assuring fair and equitable decisions sensitive to the needs of all affected people.

Analyzing Population Growth

There are two "population communities" that must be understood: the local setting and the source of impact.

The local setting is the local community or long term resident population being affected by the new development. The source of impact is the new project or growth disturbance being introduced into the community—for example, an influx of newcomers who may be commuters, retirees, construction workers, or a combination of these. Until these two population communities are fully integrated, they can be viewed as having different social systems, each composed of a variety of people with varying values, expectations, concerns, and patterns of life.

Population analysis of each of these two groups should include knowledge of the population characteristics and an understanding of the changes occurring in the population over time. This information is essential for knowing what life is like for both the local setting community and the source of impact community. It is also critical for anticipating what life might be like in the future for each, given the possible stresses, unfamiliar experiences, new responsibilities, and personal adjustments that may result when the two groups come together.

The Framework for Analysis

Analysis of community population trends requires information about the structural characteristics of a population and population processes or how a pop-

source of impact: • new industry • expanded recreation • retirement development population changes

changes in:

- housing demands
- tax structures
- cost of services
- public facility needs
- government regulations
- safety and protection demands
- street, sewer, and sanitation needs
- community cohesion
- individual mental health
- organizational stress



¹ For a thorough explanation of these and other components of the Growth Impact Assessment and Management Model see Faas and Horrell, 1979.

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unation changes over time. Both the characteristics and the processes are equally important to understanding population. Each has an effect on the other; therefore, they should be examined together. For example, if a young labor force including women in their childbearing years moves into a retirement community, the existing age structure of the local setting could be lowered considerably by the birth rates of the newcomers. A shift in age structure alone can have a significant effect on the need for different kinds of educational facilities, health and counseling services, and recreational programs.

Structural characteristics refer to descriptive information about population size, distribution, and composition. For example, a group of new community residents must be understood in terms of how many there are, where they will be locating, and such characteristics as age, sex, cultural background, family type, and so on.

The usefulness of knowing population characteristics cannot be overemphasized. Nationally, newcomers to nonmetropolitan areas tend to be younger and better skilled than long term residents. Newcomers to metropolitan areas seem to include an increasingly high proportion of well-educated, highly trained young adults. Newcomers representing higher socioeconomic classes bring different expectations in such areas as lifestyle, agency and business efficiency, and capital improvements (Lichter, Heaton, and Fuguitt 1979).

Population processes include fertility, mortality, and migration. They are as important to population analysis as the foregoing structural characteristics. These causes of population change are both determinants and consequences of population size, distribution, and composition. For example, a particular population grows (or declines) as a result of babies being born into it, people departing through death, people moving in, or people moving out.

The balance that results between births and deaths is the *natural increase*. The balance that esults from inmigration and outmigration is *net migra*-

Table 1. Important elements of structural characteristics and processes of population.

population growth. Think of it this way: the population is being increased by the birth of infants, but at the same time is being decreased by the deaths of people of all ages. Concurrently, inmigrants are arriving and outmigrants are departing. These four debit/credit components (birth, deaths, inmigration, outmigration) are the basis of population size.

Table 1 lists the most important elements to consider in examining structural characteristics and population processes together.

Trying to collect and interpret data on all of the preceding characteristics and processes, particularly at one time, may be neither practical nor necessary. The section that follows will outline some of the factors to consider in determining what population analysis information will be most helpful. Because a vast amount of population data is available, there is danger of being overwhelmed by the sheer volume of statistics. In the early stages, try to limit the analysis by narrowing the problem for which information is needed. Define the key questions to be answered; know specifically what the information is to be used for:

- Is it intended to demonstrate a specific need (expanded school capacity, recreation facilities for teens, improving busing for the elderly)?
- Is it intended to provide an estimate of a particular target population (elderly residents, newcomer households, women of childbearing age, the unemployed, commuters)?
- Is it intended to evaluate the impact of a change in service (a new shopping center, an ambulance service, a counseling center)?

Structural characteristics

Size refers to the number of people in the local setting and how fast this has been growing or declining over the years. For example, if the population has been relatively stable or in a state of decline, a rapid influx of new people may cause considerable financial and social stress.

In analyzing the size of the population, try to distinguish between absolute population change and relative population change. Each conveys a different picture.

Absolute population change is the actual number of persons added or lost during a specified time period. While actual numbers are not as useful when comparing one community to another, they can provide a sense of how significant the rate of growth or decline is.

Relative population change is the percentage change in population for a particular time period. This figure can be used to compare one community's population trends objectively with those of another community. Percentage changes are frequently cited in census publications and agency reports; once they have been calculated, comparisons can be made easily.

The usefulness of both absolute and relative population growth figures can be illustrated by con-



^{*} Inmigration and outmigration refer to migration within a nation immigration and emigration refer to migration between nations.

sidering a community of 1,500 people that grows to 4,500 in 3 years. Although the absolute population size of 4,500 does not seem large, the figure represents a 200-percent growth rate. A total of 3,000 newcomers descended on a community that originally was only half that large. The growth rate for this hypothetical community is calculated this way:

Also examine the size of the newcomer population. It may be difficult to predict exactly how many people may be involved, particularly if they are expected to arrive at different times. Varying numbers of people may come in planning, construction, and operational phases of a new development. Estimates of the newcomer population will not come from census materials. Sometimes they can be obtained from the developer, construction firm, or relevan' government agency. It may also be helpful to ask another community that has experienced a similar type of impact. Estimates can only be approximate, given the variety of factors underlying people's motivation to move to a particular community. One should also be sensitive to obvious overestimates or underestimates of new-resident population that may be provided by private firms with vested interests. Overbuilding facilities for populations that never materialize or failing to plan for growth and, as a result, being faced with boomtown conditions are both good reasons for caution in the use of population projections.

Knowing approximately how many people the source of impact may bring, and when they will come, can assist in planning for additions to schools, sewer and water hookups for projected housing developments, and other capital improvement items. A knowledge of how long the newcomers plan to stay may be extremely valuable in planning for permanent and temporary facilities.

Distribution refers to the geographic location or settlement patterns of the population A look at the county planner's map of residential sites can reveal a lot about population density A visual study of population dispersal should provide a general sense of how housing units are clustered—for example, around a lake, down a valley, on a hillcrest, or adjacent to railroad tracks. If possible, obtain a count of housing units in designated areas to determine housing density. The local housing agency may also be able to assist in identifying "density pockets." such as those areas where there are a lot of young adults, elderly, or ethnic group residents.

Consider what is known about population distribution in the local community; then apply it to what is known about the newcomer population. The following questions may be helpful:

- Where are newcomers most likely to live?
- What effects will the newcomers' residential location have on existing settlement patterns?
- How will this affect density per housing unit? For example, will a high number of people share one housing unit or will a high number of people live alone?

Some of these answers may be difficult to anticipate however, the information may be invaluable later. Several hundred construction-worker families could put considerable strain on existing mobile home parks and apartment complexes. The result could be overcrowding, excessive noise, and sae tation problems—all of which create adverse physical mental, and environmental conditions.

Composition refers to the many personal characteristics represented in the population. A thorough understanding of the individual makeup of the long term resident population is central to anticipating possible impacts of a newcomer population. There are a great many composition characteristics that can be examined; however, it is best to limit the analysis at first Age and sex are the two composition characteristics most frequently included. They are closely related to numbers of births and deaths, and therefore are essential to understanding population changes.

Knowing the numbers and proportions of people in certain age groups is essential for projecting the need for such things as school additions, new hospital wings, prenatal clinics, and bus services. If the present population is disproportionately elderly, a nevicomer population of young families may suggest a need for teenage recreation facilities, improving the maternity ward, or a new wing on the high school. These solutions may not be practical, however, if this newcomer population is only staying for one year. If newcomers are predominantly male construction workers, this may offer income-earning opportunities for retired residents who have large houses with extra living space. The sexual imbalance created by a lot of male construction workers may also put strain on families with teenage children and on community recleation facilities.

Additional composition characteristics that might be examined in both the local setting and the incoming population are cultural groups, family types and sizes, income, education, and occupation. Restrict the analysis to the ones that will answer high-priority questions.

Problems of social integration can be anticipated and prevented by learning more about cultural groups and ethnic backgrounds of present community residents. For example, what are the absolute numbers of Blacks, Hispanics, Native Americans, or Asians compared to Caucasians? If the composition of the newcomer group upsets the usual balance, probably both groups will feel it. Plan systematic ways of easing potential disruption—for example, minority representation on advisory committees, acceptable recreational opportunities, and sources for customary food

Are there additional political, religious, or status alliances that may be upset by newcomers who are intolerant or oblivious of such affiliations? Community solidarity may be threatened unless planners and leaders find ways to gently merge one group with the other, or to protect those cultural identities that have deep value. In the same way, understanding the predominant family types or living arrangements among both long term residents and newcomers may help to ease potential lifestyle and value differences.



Look at the potential size of newcomers faindies. Among some ethnic groups— the Hispanic, for example—the average number of people sharing one housing unit is frequently larger than among Caucasian families. A large number of high-dc sity family types should prompt planners to consider housing arrangements and designs that accommodate this need and acceptable recreation facilities to relieve the pressure of crowded accommodations. On the other hand, newcomers may consist of a young adult population, many of whom are in management positions. This type of population may have few children and small households.

The income factor is significant, particularly if population changes bring wide income discrepancies. For example, a low-income community may be looking forward to a new development in that new residents will bring added spending power; what the community may overlook is the newcomers' added service needs. The cost of expanding fire or police protection or sewer hook-ups is often borne equally by long term and new residents. Consider who will bear the cost if new residents live in apartments or mobile home parks; property taxes on the existing low-income population may be prohibitive.

Educational and occupational information about local residents may help anticipate new employment opportunities. A new industry may require certain skills in its labor force; however, if these skills are not available locally, an alternative labor source will be found. If jobs are needed, the community could develop appropriate training programs to prepare local residents for employment. If possible, try to anticipate educational and occupational backgrounds of new residents, too. Newcomer spouses may be accustomed to holding good jobs, or to participating in adult education classes. Why not plan ahead for these needs? It may be possible to take advantage of incoming resources to ease the newcomers' adjustment problems.

Population processes

Fertility is discussed in terms of crude birth rates and age-specific birth rates. The number of children born affects, and is affected by, many dimensions of society. This factor is reflected in labor force availability family types, housing requirements, and social service needs. It is tied not only to biology but also to ethnic and religious background, place of tendence, income level, and educational attainment. This factor, therefore, must be looked at in relation to both local and incoming population structure.

Crude birth rate is one way of describing births. This measure is included in most census reports. It refers to the yearly number of live births per 1,000 population. It is a general measure of births and may be biased by the sexual balance and age structure of the population. For example, it may show an artificially low measure of fertility where there is a high proportion of men in the community and a shortage of women. Similarly, it may reflect a high birth rate if the proportion of women in the population is high.

General tertility rate is also used in population reports to measure birth rates. Unlike the crude birth

rate, it is sensitive to age and sex composition. It represents the number of births that occur in a year per 1,000 women of childbearing age (considered to be between 15 and 44 years)

Use a measure of births to determine if there is, anything unique about birth rates in your to: a community. Are the number of births comparable to those of the state--and if not why not? Perhaps residents represent high or low proportions of one age or ethnic group. In considering the newcomer population, would you expect their birth rates to be any different than those exhibited by the local community? Birth rates are extremely difficult to predict. especially now among the young adult population Young adults appear to be postponing their children; however, experts disagree on whether or not this will continue. Irregardless, a community should be able to make an informed guess about future numbers of children to be accommodated. Schools, day care centers, clinics, medical facilities, and social services all require advance planning

Mortality represents another factor contributing to population growth or decline. Today, there is a tendency for people to live longer. This has obvious effects on population size, particularly if birth rates are high. Likewise, the same trend may affect population composition—in that American women have a longer life expectancy than American men. Without looking at population structure and processes interdependently, one might mistakenly conclude that a high number of deaths implies an unhealthy community, and this may not be true. This emphasizes the importance of studying several pieces of population information to obtain a true picture.

A community needs to know something about deaths among specific age groups—for example, among infants or teenage mothers. It also may be useful to look at deaths attributed to specific causes such as traffic accidents, industrial safety hazards, or seasonal deaths associated with tourism. Past trend information will provide a useful benchmark against which to measure future changes. For example, a rapid population increase may accelerate the number of accidental deaths. Likewise, if birth rates increase and prenatal care is inadequate, there may also be more infant and maternal mortality.

The crude death rate is one measure of deaths used in vital statistics reports. This is the total number of deaths occurring in 1 year per 1.000 people. As with the crude birth rate, it hides information that may be helpful to planners. Age-specific death rates would probably be more useful—for example, infant mortality. The infant mortality figure represents the number of infants dying in their first year of life for every 1,000 live births. Other age-specific death rates are the number of deaths of persons of a certain age per 1.000 persons of that age in the population.

If community data show a high rate of infant deaths or deaths in other age groups (when compared to the state figure), try to determine why this population group has not been surviving. Will continued population growth accelerate the problem? Are emergency medical care resources sufficient? Do newcomers' belief systems about health care.

complement or conflict with those of long term residents?

The foral vital records office, hospitals, or doctors may be able to supply numbers of deaths from specific causes. This is an important area to watch as a community experiences a rapid population increase. Roads may not be designed to handle in creased traffic. There may be more heavy construction equipment and fewer experienced operators. Play areas for children may not be adequately planned or supervised. There may be a shortage of trained medical personnel and emergency services. The ability of a community to prevent or respond to accidents will be reflected in accidental death rate figures.

Population movement contributes to the size of a community. A population becomes larger as it experiences an influx of migrants, and smaller when its members leave to join another population elsewhere. This inmigration and outmigration affects not only the population's size, but also its composition and distribution.

Uhlman and others (1975) provide an illustration of how population movement can affect birth and death rates. In two energy-impacted Wyoming communities, newcomers were not only much younger, but they also had larger households and more children at home than did long term residents.

Leistritz and others (1978) who studied Northern Great Plains energy development sites point out the potential difference in population composition among the migrants themselves. Operating workers have a greater tendency to be younger, married, and have larger families than construction workers. Construction workers are less likely to bring their families; they commute longer distances than operating workers.

One population movement figure that may be of interest is net migration. This is the net balance between arrivals and departures, or the prevailing balance between in- and outmigration. If departures exceed arrivals, net migration is considered to be negative. If arrivals exceed departures, then net migration is considered to be positive

If natural increase is low, as it is in many western states today, a high growth population is the result of two things: retaining the resident population and, at the same time, attracting newcomers from outside. Outmigration must be low and inmigration must be high

While important in assessing population growth, net migration estimates provide little insight into the overall numbers of people moving in or out. Net migration gains and losses are only surface indicators of a much more significant crosscurrent of movement. Net migration only describes the net result of people's moves. It really tells you nothing about the actual numbers of people being added to the community through inmigration, or the actual numbers leaving the community through outmigration. For example, a community may gain 200 people through net migration. This figure could hypothetically be the net result of the moves of 2,000 people. 1,100 people moving in and 900 people moving out. If this occurred within a short period of time, this situation

could put extreme pressure on a small fural community. An added 200 people might not strain available facilities and services beyond capacity, but the change in people within the community would cause other, more specific problems.

Knowing the gross migration figure will also help a community to get a more realistic picture of in- and outmigration. This is the total or aggregate number of inmigrants and outmigrants—the sum of all arrivals and departures.

After studying the components of the local community's net migration figure, the following questions might be asked to provide further planning insight:

- Is net migration more affected by inmigration or outmigration?
- Is net population change more affected by natural increase (births and deaths) or by actual movement of people in or out?
- Is it possible that some of the long term residents will rnove out of the local community in response to new developments?

Growth-related inmigration and outmigration may fluctuate in timing of arrivals and departures. This may be the case when commuters are either coming in for shopping or recreation, or when residents are going out for employment. A community should identify possible "pressure points" and attempt to plan ahead to ease strains. For example, winter recreation may be the drawing attraction bringing high numbers of seasonal inmigrants. This may precipitate a need for extra facilities and services in one season only. A community experiencing seasonal population growth may have to ask itself how these extra costs can be justified on a year-round basis—or if there is a way to take advantage of them in other seasons, too.

Sources of Information

In your local community or county there are probably a number of readily available sources for population information. Census and vital statistics data that have been systematically collected and compiled will be the most easily accessible source. Normally some of these publications can be found in such places as the county court house, county Extension office, public health office, public library, or county/district planning office.

Census data are collected by the U.S. Bureau of Census every 10 years, including information on most population structure characteristics and on population processes. Four volumes are published about each state, including statistics about townships, municipalities, counties, and metropolitan areas. Current data on small communities is still somewhat difficult to obtain. Usually, what is available is based on projections from earlier records, although some sampling is done monthly for more reliable annual estimates of population change. The Current Population Reports, the product of this

monthly survey is available by annual subscription

Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402 Cost. \$70.00

Particularly helpful for size and income estimates between censuses are two publications in the P-25 series. "Per Capita Money Income Estimates for States Counties, and Incorporated Places," and "Estimates of the Population of Counties and Metropolitan Areas." Both reports are issued periodically during the decade

Census information is available in a variety of forms, including microfilm and computer tape. Many colleges and universities, regional and local planning commissions. libraries, and state agencies purchase these for public use. In addition to the Census of Population, there are also Censuses of Agriculture, Housing Business and Manufacturing, Governments and Transportation.

County and City Data Books are available from the US Bureau of Census in computer and bound form. Most county planning offices have these. These combine easily manageable data from the Censuses of Population, Housing, Governments, and Manufacturing Most of the information is aggregated by state, county, city, and standard metropolitan statistical area.

In most states there is one designated office that collects, compiles, and publishes state population information. This may be an official state agency at the state capital, a university department, or something comparable. Ask your public library or county Extension office the location of this source. Usually, annual data summaries are available at minimal or no cost.

Vital statistics data offer another excellent source of population information. Most states compile and publish these records annually Information is usually included on births, deaths, marriages, and divorces. Several useful measures discussed in the population processes section of this publication are normally available, such as crude birth rates, crude death rates, age-specific death rates, and deaths according to specific causes. If vital statistics information is used in conjunction with census data, this should provide an adequate tool for examining population processes and factors associated with population growth.

Usually, one state agency collects, organizes, and disseminates vital statistics information. In some states this is done through a state health department. Annual summaries of vital statistics usually can be obtained at no cost. In the community, vital statistics materials are often found at health or social service offices, community action centers, libraries, planning commissions, or court houses.

At the federal level, the National Center for Health Statistics aggregates vital statistics information annually by state, county, and city. The same source has periodic data on health facilities such as hospitals, nursing homes, and clinics and medical personnel.

Summary

This brief overview presents a framework for analyzing population changes in a rapid growth situation. It points out some of the ways agency representatives and local leaders can use population information to make informed guesses about social and economic effects of development. Suggestions are included for guiding citizens in responsible public decisionmaking and policymaking so that changes can be systematically managed.

Population data is readily available in most communities at minimal cost. Sources of population data are included. In order not to overwhelm the citizen or planner who may be collecting population information, this framework focuses on priority needs so that only the most useful information is sought.

Two "population communities" must be considered: the local community of long term residents and the newcomer community. The suggested framework for population analysis poses practical growth questions that any rapidly growing community can apply in analyzing its own circumstances.

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This publication is part of the Coping with Growth series produced by the Western Rural Development Center Other titles in the series include

- Evaluating Fiscal Impact Studies Community Guidelines
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- Coping with Rapid Growth A Community Perspective
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